

NIH/DOE JOINT WORKSHOP

What is the Demand for Research Radionuclides and How Can It Be Met?

**Isotope Demand 2002- 2010: NIH
Support of Research Using Isotopes**

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Perspective of NCI- *not* NIH
“ This is a *Fact-finding* mission”
This is NOT NCI/NIH Policy!!

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- Richard Reba, Biomedical Imaging Program, DCTD
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NCI grant portfolio

- 156 grants, mainly RO1 and SBIR
- 92 single isotope; 56 multiple isotopes
- Spread around- 19 Program Directors with BIP- 79 and RRP- 52
- ^{18}F - 20; $^{99\text{m}}\text{Tc}$ - 15; $^{123,124,125,131}\text{I}$ odine - 15; ^{90}Y - 9
- Others: ^{211}At , ^{213}Bi , ^{137}Cs , ^{67}Ga , $^{64,67}\text{Cu}$, ^3H , $^{111,114\text{m}}\text{In}$, ^{15}O , ^{32}P , ^{103}Pd , ^{188}Re

NCI Support

- Support is generally for costs on approved and funded research grants.
- Priority depends on the quality of the science.
- RAID programs help develop pre-clinical reagents

Future projections

Reactor Produced

- ^{177}Lu - RIT trials, targeted with peptides
- ^{153}Sm , ^{166}Ho - bone palliation, RIT
- ^{149}Pm - targeted with peptides, RIT
MURR (Missouri Univ. Reactor)
ORNL (Oak Ridge)
- ^{67}Cu - RIT
BNL (Brookhaven)

Future projections

Cyclotron Produced

- ^{211}At - α -emitter; $T_{1/2} = 7.2$ hr - RIT
- ^{64}Cu - β^+ -emitter, $T_{1/2} = 12.7$ hr - RIT, peptides
- ^{86}Y - β^+ -emitter, $T_{1/2} = 14.7$ hr - PET imaging for RIT Dosimetry (^{90}Y)
- ^{124}I - β^+ -emitter, $T_{1/2} = 4.2$ d - PET imaging
- ^{89}Zr - β^+ -emitter, $T_{1/2} = 3.27$ d - PET imaging

Future projections

Others:

- ^{225}Ac - α -emitter; $T_{1/2} = 10 \text{ d}$ - Source of ^{213}Bi ; α -emitter; $T_{1/2} = 47 \text{ min}$ - RIT;
ORNL (Oak Ridge)
- ^{224}Ra - α -emitter; $T_{1/2} = 3.7 \text{ d}$ - Source of ^{212}Bi ; α -emitter; $T_{1/2} = 60 \text{ min}$ - RIT; (^{212}Pb)
- $^{195\text{m}}\text{Pt}$ - Auger emitter; $T_{1/2} = 4 \text{ d}$, DNA binding...
- $^{117\text{m}}\text{Sn}$ - IT emitter - $T_{1/2} = 14 \text{ d}$, bone palliation
- ^{188}Re – β -emitter; $T_{1/2} = 16.9 \text{ hr}$, bone palliation
ORNL (Oak Ridge)
- Others..... (^{186}Re , ^{105}Rh , ^{198}Au , ^{111}Ag , etc....)

Conclusions

- Anticipated uses are for molecular imaging and radiolabeled molecules for therapy
- Most are currently used for diagnosis
- Costs can vary greatly by where they are produced.
- Priorities will be based on science but availability may ?? impact “fundability”

Emergency source of isotopes from NASA

(shipping not included)

